

FEDERAL REPUBLIC OF GERMANY  
GERMAN PATENT OFFICE  
PATENT NO. 3,922,342 A1  
(Offenlegungsschrift)

Int. Cl.<sup>5</sup>: D 06 F 39/02  
Filing No: P 39 22 342.6  
Filing Date: July 7, 1989  
Laid-Open to Public  
Inspection: January 17, 1991

DEVICE TO LOCK AND UNLOCK A CONTAINER  
IN CONTACT WITH A PERFORATED BASE

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[Abstract]

A device to lock and unlock a container in contact with a perforated base, in particular, a detergent-holding container, to be placed in a washing drum, is proposed, which can mesh through a locking hook, which is anchored on the inside of the container bottom and can be tilted by 90°, through a housing opening on the container bottom into a recess of the perforated base and can therefore anchor the container to it.

Description

The invention concerns a device to lock and unlock a container in contact with a perforated base, according to the type in the main claim.

Containers are known which are typically used in washing operations in rotary washing machines, particularly for liquid detergents in the form of so-called "dosing granules." These detergent-holding containers are filled with liquid detergent for the washing process and are placed with the wash in the drum of the washing machine. During the washing process, these containers are stored in a freely movable manner, in the drum of the washing machine. Through their direct use in the washing drum, a uniform distribution of the detergent consumed during the washing process should be attained and detergent losses in the washwater discharge system of the washing machine are avoided. The disadvantage is found, however, in that the detergent-holding containers, which can move freely in the drum, are moved along, uncontrolled in the drum during the washing machine operation, with the drum moving in a radial direction during the course of the operation, wherein, from time to time, the radial movements occur in opposite directions, which leads to a disturbing generation of noise.

The problem of the invention, therefore, is to create a container, which can be engaged with and disengaged from the perforated base of the washing drum, by means of a locking and unlocking device.

The solution to this problem is obtained with a device of the type mentioned in the beginning with the features indicated in the characterizing part of the main claim.

The snap-locking element anchored on the inside of the container bottom facing the perforated base brings about a secure connection of the container with the perforated base, after its engagement in a recess of the perforated base. With a movable base, in particular, with washing machine drums, which are perforated and provided with driving ribs, it is thus possible to attain an anchoring of the container to the drum, which is not influenced by the movement of the drum. To

re-fill or to replace the container, it is, nevertheless, possible to detach it from the perforated base, without difficulty.

The simple but secure anchoring of the container on the perforated base is brought about by a locking hook, which forms the snap-locking element, whose production costs are low. Since this is constantly in contact with water during the washing process, it is preferably manufactured from stainless steel, wherein its corrosion susceptibility can be ruled out.

The simple and secure affixing of the container on the perforated base, which takes place during assembly, is brought about by a tilting of the locking hook from a housing opening of the container bottom. The tilting takes place in such a way that the locking hook is tilted axially by 90° around an axle rod which runs through its longer leg, wherein the shorter leg of the locking hook meshes into a recess of the perforated base and can anchor the container there. In this locked position, the longer leg of the locking hook engages thereby into a clip-clamp, provided in the container, wherein the position of the of the locking hook is secured.

This also guarantees an uncomplicated assembly of the detergent-holding container, which can easily be executed. A meshing of the container with the perforated base takes place as the result of a slight sideways movement carried out when the container comes into contact with the base. The sideways movement carried out in this way causes the locking hook, which at first projects only with the tip of its shorter leg from the housing opening, to tilt out from it and to mesh into a recess of the perforated base. A nonproblematic dismantling is also possible with a sideways movement carried out in the opposite direction, since as a result of this, the locking hook tilts back, once more, into its starting position.

A particularly advantageous development of the invention provides for the container to be engaged with a radially movable, perforated base, against its direction of movement with the perforated base. The assembling and dismantling forces do not take place in the load direction of the drum, brought about by the washing machine operation--that is, not in a radial or centric direction to or away from the centerpoint of the drum. In this way, high holding forces can be attained with a simultaneously low assembling and dismantling expenditure.

Finally, in order to avoid the scratching of the perforated container, the invention provides for at least the shorter leg of the locking hook to have a plastic sheath or to be made entirely of plastic.

The invention is explained in more detail below, with the aid of the drawing. The figures show the following:

Figure 1, the underside of a detergent-holding container with a locking hook located on it;

Figure 2, the container shown in Figure 1, seen from above;

Figure 3, the container in a side view in cross-section;

Figure 4, the container from the view designated by G in Figure 3;

Figure 5, the clip-clamp, in accordance with the invention, from the topview, seen through section H in Figure 3;

Figure 6, the snap-locking element, in accordance with the invention, in a side view;

Figure 7, the snap-locking element, shown in Figure 6, shown spatially, in part in sectional form; and

Figure 8, the assembly course during the locking and unlocking of the container.

The underside of the container, shown in Figure 1 shows the container bottom 1 of the detergent-holding container, on which a housing recess 2 is located, through which the locking hook, which is not depicted in the drawing, can be tilted. On the container bottom 1, four stop points 3 are also placed, with which the container fits elastically on the perforated base of the washing machine drum.

The topview of Figure 2 on the detergent-holding container shows two introduction openings 4ab, provided to introduce the detergent, and four grip grooves 5, which are located on the upper side of the container, which runs flattened toward the outside. The grip grooves 5 are thereby provided for easier handling and as secure holding points. In this way, after the container is placed in the washing drum, the sideways movements on the perforated base, required for container anchoring, are facilitated. The intermediate crosslink 6, provided between the introduction openings 4a,b comprises the clip-clamp, which cannot be seen from the drawing, and the snap-locking element, which also cannot be seen from the drawing.

The side view shown in Figure 3 shows the container bottom 1 and the locking hook 7, projecting through its housing opening 2, which hook in the depicted representation, is located in the tilted-out locking position. The grip grooves 5 are alluded to on the longitudinal walls 8 of the container, which walls are flattened toward the outside. On the right side of the representation, an indentation 9 is visible, which leads to the introduction openings 4a, b. In the intermediate crosslink 6, shown in sectional view, the clip-clamp 10 is also visible.

The representation of Figure 4, shown in sectional view, shows the view of the locking hook 7 in the clip-clamp 10, identified as viewing direction G in Figure 3.

Figure 5 shows an enlarged section of the clip-clamp 10 from the view designated by H-J in Figure 3. The clip-clamp 10 contains a clip opening 10a, into which the locking hook meshes, with its longer leg, in the locking position.

Figure 6 shows the locking hook 7, which has a longer leg 7a and a shorter leg 7b.

An axle rod is conducted through a borehole 11 on the leg 7a, around whose axis the locking hook 7 can move in the direction of the arrow. The position of the locking hook, which can be seen in Figure 6, shows its locking position, in which it anchors the container on the perforated base.

Figure 7 shows the locking hook 7 in the same locking position. The leg 7a is thereby engaged in the opening 10a of the clip-clamp 10. The clip-clamp 10 is shown in a partial section, since it is anchored in the total length of the intermediate crosslink 6 for reasons having to do with injection molding technology. The locking hook 7 tilts around the axis of the axle rod 12 during the engaging and disengaging process.

Figure 8 finally shows the assembly course for the locking and unlocking of the container on the perforated base 13. In the starting position, the visible tip of the leg 7b protrudes from the housing opening of the container bottom. When the container comes into contact with the perforated base 13, the locking hook 7 tilts from the housing opening and meshes into a recess 13a of the perforated base. The tilting is attained by a right sideways movement, with reference to the drawing. By an opposite sideways movement, the locking hook 7 finally tilts back, once more, into its starting position and in this way, makes possible nonproblematic detachment of the container from the perforated base. The movement mechanisms described during the assembly and dismantling operations, are shown in the figure by arrows. The assembly and dismantling take place with a movable perforated base, in particular, with drums from washing machines, against the load direction, which arises, for example, due to the operation of the washing machine. To prevent the loosening of the locking hook as a result of radial movements of the washing drum in the washing operation, the detergent-holding container to be anchored is not engaged in the radial or in the centric direction to or from the centerpoint of the drum, but rather in the direction in which the container is introduced into the washing drum. A screwing off of the container as a result of the generated radial movements of the perforated base 13 is thereby ruled out in that the locking hook 7 is engaged firmly in the locked state, in the opening of the clip-clamp 10a.

In order to avoid a scratching of the perforated base 13, the shorter leg 7b can be provided with a plastic sheath or can also be made entirely out of plastic, wherein, of course, the entire locking hook 7 can, of course, also be made of plastic.

### Claims

1. Device to lock and unlock a container in contact with a perforated base, in particular, a detergent-holding container, in contact with the inside of a perforated washing machine drum, provided with driving ribs, characterized in that the container is arranged so that it can engage and disengage by means of a snap-locking element (7), which is anchored on the inside of its container bottom (1), which faces the perforated base (3), on a recess (13a) of the perforated base (13).

2. Device according to Claim 1, characterized in that the snap-locking element (7) consists of a locking hook made of stainless steel, which has a longer leg (7a) and a shorter leg (7b), which are bent by 90°, with respect to one another.

3. Device according to Claim 1 or 2, characterized in that an axle rod (12) is conducted through a perpendicular borehole (11) of the longer leg (7a) of the locking hook (7), and the locking hook (7) can move by 90° around the axis of the rod.

4. Device according to one of the preceding claims, characterized in that when the container comes into contact with the perforated base (13), the locking hook (7) engages through a housing opening (2) on the container bottom (1), into a recess (13a) of the perforated base (13), by means of an executed sideways movement and disengages by means of a sideways movement executed in the opposite direction.

5. Device according to one of the preceding claims, characterized in that the locking hook (7), upon coming into contact with the perforated base (13), projects with a part of its shorter leg (7b) from a housing opening (2), located on the container bottom (1), and as a result of the sideways movement executed upon meshing into a recess (13a) of the perforated base (13), tilts around the axis running through the longer leg (7a) and thus engages in the recess (13a).

6. Device according to one of the preceding claims, characterized in that the locking hook (7) engages, with its longer leg (7a) in the locked position, into a clip-clamp (10), located on the inside of the container bottom (1).

7. Device according to one of the preceding claims, characterized in that the container is locked in a radially movable, perforated base (13), against its movement direction with the perforated base (13).

8. Device according to one of the preceding claims, characterized in that at least the shorter leg (7b) of the locking hook (7) has a plastic sheath or is made entirely of plastic.

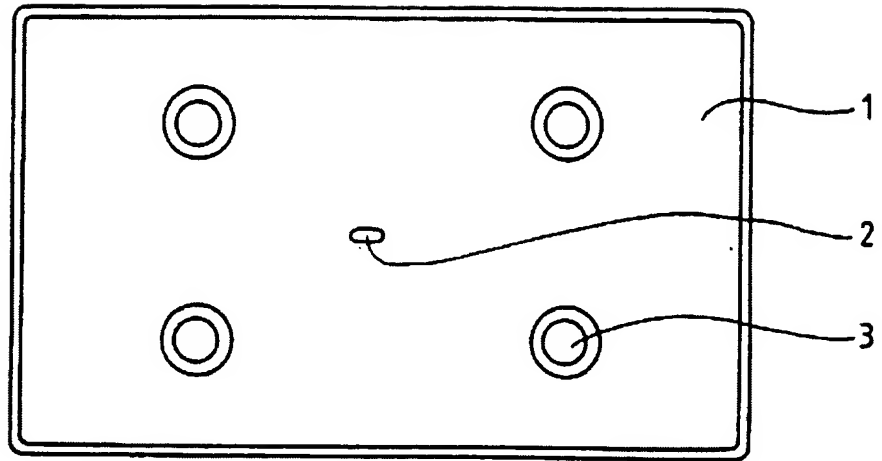


Fig. 1

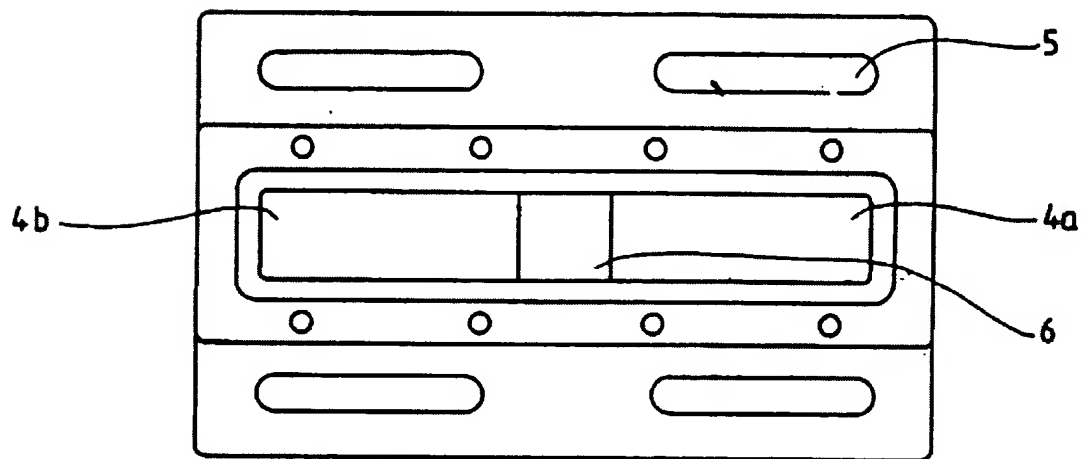


Fig. 2

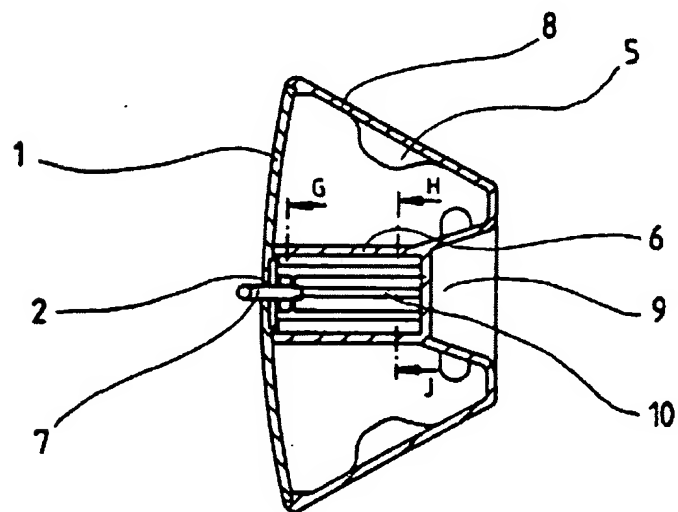


Fig. 3

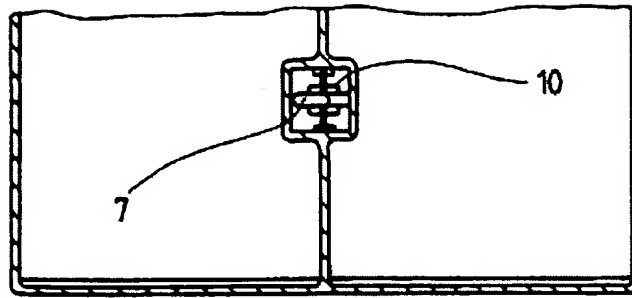


Fig. 4

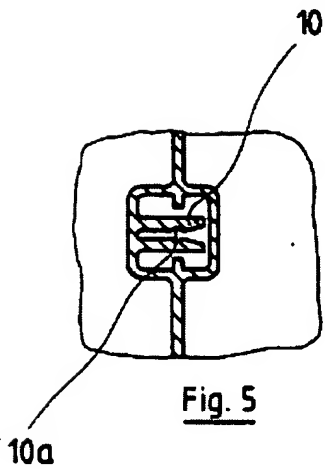


Fig. 5

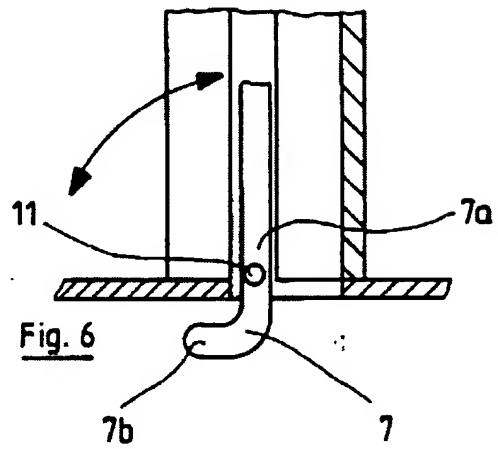


Fig. 6

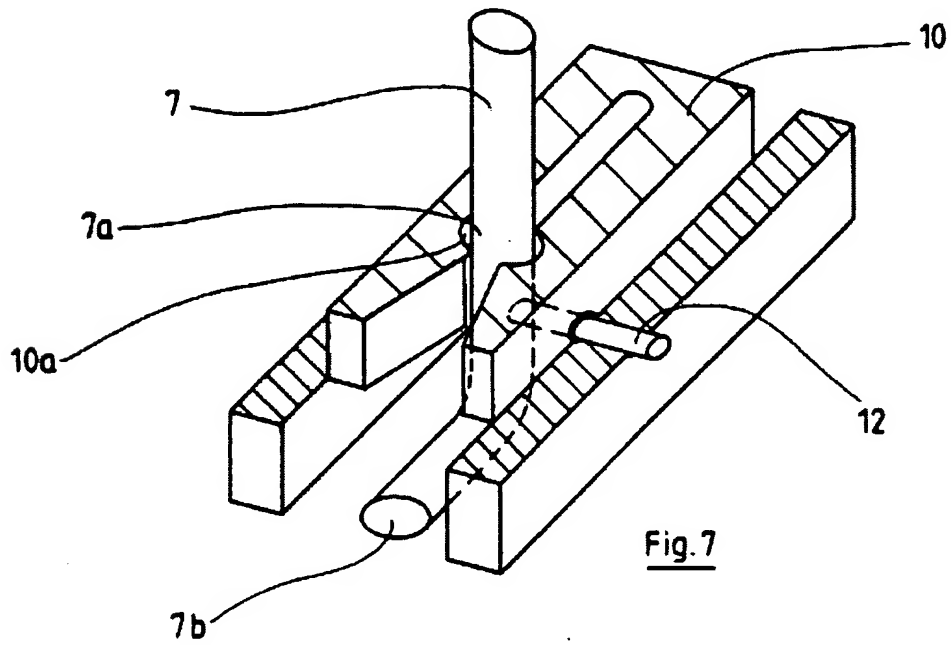


Fig. 7



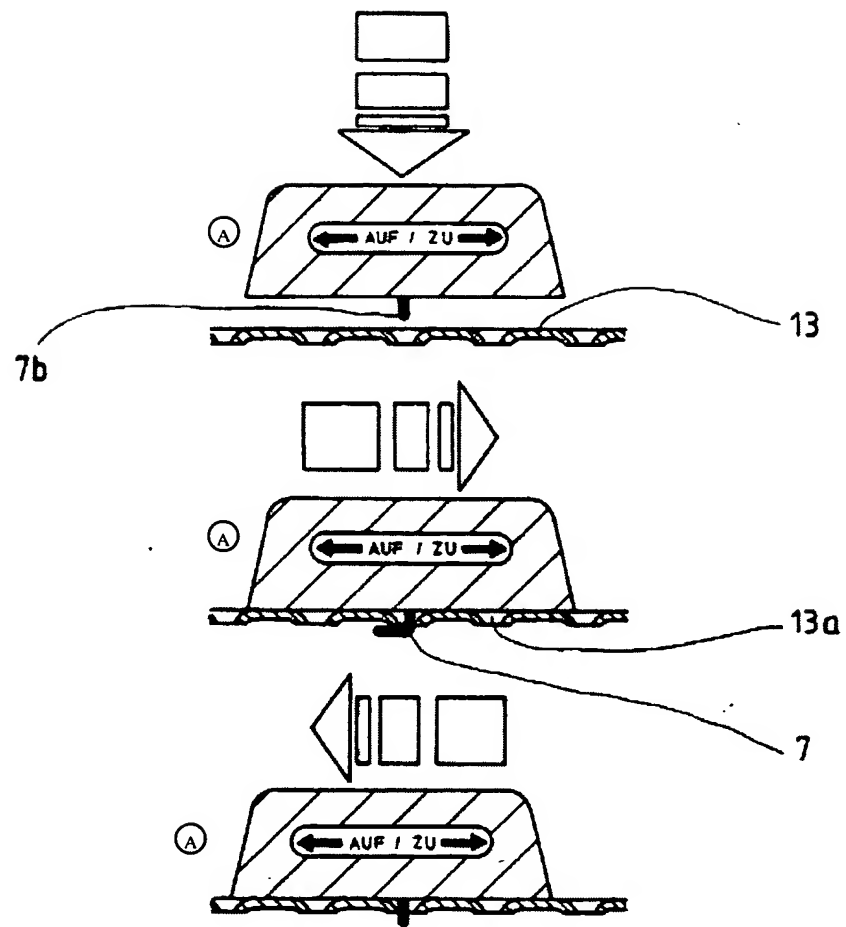


Fig. 8

Key: A    Open/closed

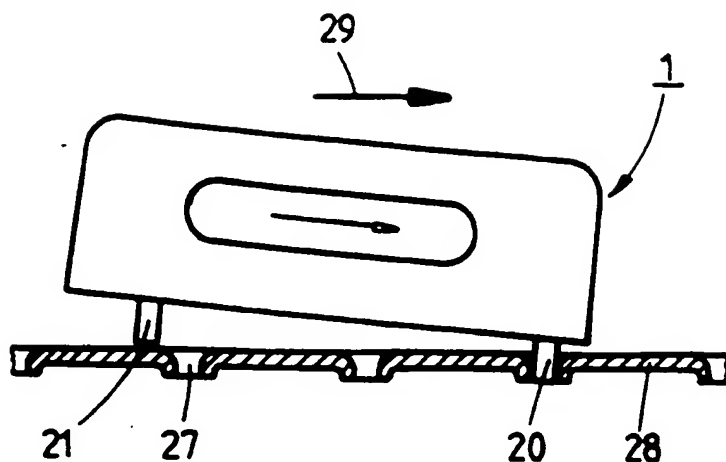


FIG. 3a

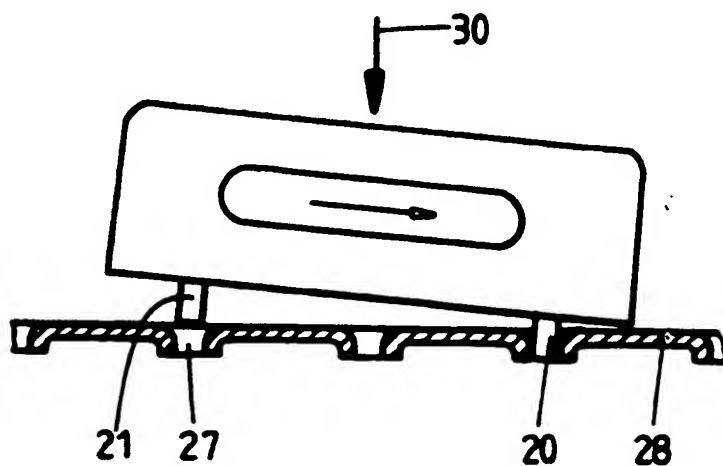


FIG. 3b

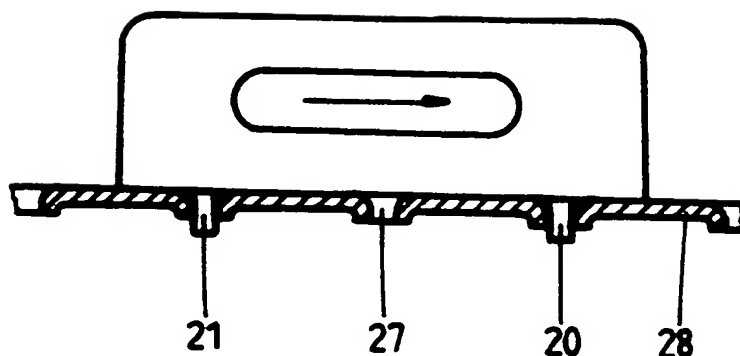


FIG. 3c

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Job No.: 1505-97907

Ref.: DE3922342A

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